




Standard 2 Flute and 3 Flute Carbide

Side Milling (Fractional)

Hardness	-		-		<20 HRC		20-30 HRC		30-40 HRC		40-50 HRC	
Work Material	Aluminum		Cast Iron		Mild Carbon Steels Mild Steels		Pre-hardened Steels Die & Alloy Steels		Pre-hardened Steels Die & Alloy Steels		Hardened Steels	
Cutting Speed	330-400 SFM		100-150 SFM		100-150 SFM		80-115 SFM		80-100 SFM		50 SFM	
Depth of Cut	$a_a=1.5D$ $a_r=0.1D$ 											
Mill Dia.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
0.015	25,000	3.9	25,000	3.1	25,000	1.7	24,810	1.2	2,290	0.1	12,725	0.2
0.02	25,000	7.1	23,855	5.2	23,855	2.6	18,605	1.6	17,175	0.8	9,540	0.4
0.03	25,000	11.1	15,905	4.9	15,905	2.7	12,405	1.7	11,450	0.8	6,360	0.4
3/64	25,000	14.0	10,180	5.0	10,180	3.1	7,940	2.4	7,330	1.3	4,070	0.5
1/16	22,290	18.6	7,635	5.5	7,635	3.4	5,955	2.7	5,495	1.4	3,055	0.6
5/64	17,830	19.7	6,105	8.4	6,105	3.7	4,765	2.9	4,395	1.5	2,445	1.0
1/8	11,145	15.8	3,815	9.5	3,815	5.0	2,975	3.9	2,750	1.6	1,525	1.0
5/32	8,915	17.5	3,055	10.2	3,055	5.9	2,380	4.2	2,200	1.7	1,220	1.0
3/16	7,430	18.5	2,545	10.7	2,545	7.2	1,985	4.6	1,830	1.7	1,020	1.1
1/4	5,575	16.5	1,910	9.6	1,910	6.4	1,490	4.3	1,375	1.5	765	1.0
5/16	4,460	18.5	1,525	10.0	1,525	6.7	1,190	4.4	1,100	1.7	610	1.0
3/8	3,715	19.5	1,270	11.2	1,270	8.1	990	4.6	915	1.7	510	1.1
1/2	2,785	19.5	955	10.0	955	7.2	745	4.3	685	1.5	380	1.0
5/8	2,230	20.8	765	12.6	765	8.3	595	4.9	550	1.7	305	1.0
3/4	1,860	21.5	635	13.2	635	8.8	495	5.5	460	1.7	255	1.1
1	1,395	18.3	475	12.6	475	8.3	370	4.8	345	1.3	190	0.8

1. Increase speeds & feeds 5-10% for Series 412 and 422.
2. Reduce speeds & feeds 20-30% for Series 462.
3. Reduce speeds & feeds 40-50% for Series 482.
4. Increase speeds & feeds 20-30% for 402 TiN.
5. Column for Hardened Steels (40-50 HRC) is for Series 402 TiN and 403 TiN only.
6. Increase speeds & feeds 20-30% for Series 403 and 445.
7. Increase speeds & feeds 20-40% for Series 403 TiN.

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
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Side Milling (Metric)

Hardness	-		-		<20 HRC		20-30 HRC		30-40 HRC		40-50 HRC	
Work Material	Aluminum		Cast Iron		Mild Carbon Steels Mild Steels		Pre-hardened Steels Die & Alloy Steels		Pre-hardened Steels Die & Alloy Steels		Hardened Steels	
Cutting Speed	330-400 SFM		100-150 SFM		100-150 SFM		80-115 SFM		80-100 SFM		50 SFM	
Depth of Cut	$a_a=1.5D$ $a_r=0.1D$ 											
Mill Dia.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
0.3	25,000	3.9	25,000	3.1	25,000	1.6	25,000	1.2	25,000	0.6	16,160	0.3
0.5	25,000	7.1	24,235	5.3	24,235	2.6	18,905	1.6	17,450	0.8	9,695	0.4
0.8	25,000	11.1	15,145	4.7	15,145	2.6	11,815	1.6	10,905	0.8	6,060	0.4
1.0	25,000	14.1	12,120	6.0	12,120	3.7	9,450	2.8	8,725	1.5	4,845	0.6
1.5	23,590	19.7	8,080	5.9	8,080	3.6	6,300	2.8	5,815	1.5	3,230	0.6
2.0	17,695	19.6	6,060	8.4	6,060	3.7	4,725	2.8	4,365	1.5	2,425	0.6
3.0	11,795	16.7	4,040	10.0	4,040	5.3	3,150	4.2	2,910	1.6	1,615	1.0
4.0	8,845	17.4	3,030	10.1	3,030	5.9	2,365	4.2	2,180	1.6	1,210	1.0
5.0	7,075	17.6	2,425	10.2	2,425	6.8	1,890	4.4	1,745	1.6	970	1.0
6.0	5,900	17.5	2,020	10.1	2,020	6.7	1,575	4.6	1,455	1.6	810	1.0
8.0	4,425	18.3	1,515	9.9	1,515	6.6	1,180	4.4	1,090	1.6	605	1.0
10.0	3,540	18.6	1,210	10.7	1,210	7.7	945	4.4	875	1.6	485	1.0
12.0	2,950	20.6	1,010	10.6	1,010	7.6	790	4.6	725	1.6	405	1.0
16.0	2,210	20.6	755	12.4	755	8.3	590	4.9	545	1.6	305	1.0
20.0	1,770	20.5	605	12.6	605	8.4	475	5.3	435	1.6	240	1.0
25.0	1,415	18.6	485	12.8	485	8.5	380	4.9	350	1.3	195	0.8

1. Increase speeds & feeds 5-10% for Series 412 and 422.
2. Reduce speeds & feeds 20-30% for Series 462.
3. Reduce speeds & feeds 40-50% for Series 482.
4. Increase speeds & feeds 20-30% for 402 TiN.
5. Column for Hardened Steels (40-50 HRC) is for Series 402 TiN and 403 TiN only.
6. Increase speeds & feeds 20-30% for Series 403 and 445.
7. Increase speeds & feeds 20-40% for Series 403 TiN.

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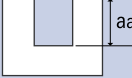
CONTINUED 





Standard 2 Flute and 3 Flute Carbide: (continued)

Slotting (Fractional)

Hardness	-		-		<20 HRC		20-30 HRC		30-40 HRC		40-50 HRC	
Work Material	Aluminum		Cast Iron		Mild Carbon Steels Mild Steels		Pre-hardened Steels Die & Alloy Steels		Pre-hardened Steels Die & Alloy Steels		Hardened Steels	
Cutting Speed	330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		43 SFM	
Depth of Cut					Dia		aa					
					D<1/32		0.25D					
					1/32<D<5/64		0.50D					
					5/64<D		1.00D					
Mill Dia.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
0.015	25,000	1.8	25,000	3.1	25,000	1.2	20,990	0.7	18,700	0.4	10,940	0.2
0.020	25,000	3.2	23,855	5.2	21,945	1.8	15,745	1.0	14,025	0.7	8,205	0.3
0.030	25,000	4.9	15,905	4.9	14,630	2.6	10,495	1.3	9,350	0.7	5,470	0.3
3/64	25,000	6.3	10,180	4.0	9,365	2.2	6,720	1.1	5,985	0.5	3,500	0.2
1/16	20,155	7.5	7,635	4.4	7,025	2.9	5,040	1.1	4,490	0.7	2,625	0.3
5/64	16,120	11.9	6,105	5.1	5,620	3.5	4,030	1.9	3,590	1.1	2,100	0.5
1/8	10,075	10.6	3,815	5.1	3,510	3.2	2,520	2.4	2,245	1.0	1,315	0.5
5/32	8,060	11.9	3,055	5.4	2,810	3.5	2,015	2.6	1,795	1.1	1,050	0.5
3/16	6,720	12.6	2,545	5.7	2,340	3.7	1,680	2.6	1,495	1.1	875	0.6
1/4	5,040	11.2	1,910	6.4	1,755	3.2	1,260	2.4	1,120	1.0	655	0.5
5/16	4,030	11.9	1,525	7.9	1,405	3.4	1,010	2.6	890	1.1	525	0.5
3/8	3,360	12.6	1,270	8.4	1,170	3.7	840	2.6	750	1.1	440	0.6
1/2	2,520	11.2	955	7.5	880	3.2	630	2.4	560	1.0	330	0.5
5/8	2,015	11.9	765	7.9	700	3.4	505	2.6	450	1.4	265	0.4
3/4	1,680	12.4	635	8.3	585	3.6	420	2.8	375	1.4	220	0.4
1	1,260	11.9	475	7.9	440	3.4	315	2.6	280	1.3	165	0.3

1. Increase speeds & feeds 5-10% for Series 412 and 422.
2. Reduce speeds & feeds 20-30% for Series 462.
3. Reduce speeds & feeds 40-50% for Series 482.
4. Increase speeds & feeds 20-30% for 402 TiN.
5. Column for Hardened Steels (40-50 HRC) is for Series 402 TiN and 403 TiN only.
6. Increase speeds & feeds 20-30% for Series 403 and 445.
7. Increase speeds & feeds 20-40% for Series 403 TiN.

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DRILLING

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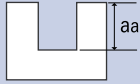
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Slotting (Metric)

Hardness	-		-		<20 HRC		20-30 HRC		30-40 HRC		40-50 HRC									
Work Material	Aluminum		Cast Iron		Mild Carbon Steels Mild Steels		Pre-hardened Steels Die & Alloy Steels		Pre-hardened Steels Die & Alloy Steels		Hardened Steels									
Cutting Speed	330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		43 SFM									
Depth of Cut	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>Dia</th> <th>aa</th> </tr> </thead> <tbody> <tr> <td>D<0.8</td> <td>0.25D</td> </tr> <tr> <td>0.8<D<2</td> <td>0.50D</td> </tr> <tr> <td>2<D</td> <td>1.00D</td> </tr> </tbody> </table> 												Dia	aa	D<0.8	0.25D	0.8<D<2	0.50D	2<D	1.00D
													Dia	aa						
													D<0.8	0.25D						
													0.8<D<2	0.50D						
2<D	1.00D																			
Mill Dia.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min								
0.3	25,000	1.8	25,000	3.1	25,000	1.1	25,000	0.8	23,750	0.6	13,895	0.2								
0.5	25,000	3.2	24,235	5.3	22,300	1.8	15,995	1.0	14,250	0.7	8,335	0.3								
0.8	25,000	4.9	15,150	4.7	13,935	2.5	10,000	1.2	8,905	0.7	5,210	0.3								
1.0	25,000	6.2	12,120	4.8	11,150	2.6	8,000	1.3	7,125	0.6	4,170	0.3								
1.5	21,330	7.9	8,080	4.7	7,435	3.1	5,330	1.1	4,750	0.7	2,780	0.4								
2.0	15,995	11.8	6,060	5.0	5,575	3.5	4,000	1.9	3,565	1.1	2,085	0.5								
3.0	10,665	11.2	4,040	5.4	3,715	3.4	2,665	2.6	2,375	1.1	1,390	0.5								
4.0	8,000	11.8	3,030	5.4	2,785	3.5	2,000	2.6	1,780	1.1	1,040	0.5								
5.0	6,400	12.0	2,425	5.5	2,230	3.5	1,600	2.5	1,425	1.1	835	0.6								
6.0	5,330	11.9	2,020	6.7	1,860	3.5	1,335	2.6	1,190	1.1	695	0.5								
8.0	4,000	11.8	1,515	7.8	1,395	3.4	1,000	2.6	890	1.1	520	0.5								
10.0	3,200	12.0	1,210	8.0	1,115	3.5	800	2.5	715	1.1	415	0.5								
12.0	2,665	11.9	1,010	8.0	930	3.5	665	2.6	595	1.0	345	0.5								
16.0	2,000	11.8	755	7.8	695	3.4	500	2.6	445	1.3	260	0.4								
20.0	1,600	11.8	605	7.9	555	3.5	400	2.7	355	1.3	210	0.3								
25.0	1,280	12.1	485	8.0	445	3.5	320	2.7	285	1.3	165	0.3								

1. Increase speeds & feeds 5-10% for Series 412 and 422.
2. Reduce speeds & feeds 20-30% for Series 462.
3. Reduce speeds & feeds 40-50% for Series 482.
4. Increase speeds & feeds 20-30% for 402 TiN.
5. Column for Hardened Steels (40-50 HRC) is for Series 402 TiN and 403 TiN only.
6. Increase speeds & feeds 20-30% for Series 403 and 445.
7. Increase speeds & feeds 20-40% for Series 403 TiN.

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